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S/N 09/732,115

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT

Applicant: Terrence Dishongh et al.

Examiner: Tuan T. Dinh

Serial No.: 09/732,115

Group Art Unit: 2841

Filed: December 7, 2000

Docket: 884.357US

Title: APPARATUS FOR SHIELDING TRANSMISSION LINE EFFECTS ON A
PRINTED CIRCUIT BOARD

RESPONSE TO RESTRICTION REQUIREMENT

Commissioner for Patents
Washington, D.C. 20231

Applicants have reviewed the Restriction Requirement mailed on October 15, 2001. Please amend the above-identified patent application as follows.

IN THE CLAIMS

Please substitute the claim set in the appendix entitled Clean Version of Pending Claims for the previously pending claim set. Specific amendments to individual claims are detailed in the following marked up set of claims.

19. (Once Amended) An electrical subsystem comprising:
- a printed circuit board (PCB) including at least one dielectric board member having a plurality of conductive interconnects for providing circuit interconnections within said electrical subsystem, said plurality of conductive interconnects including at least one [interconnect] signal line having an elongated conductive member that is enshrouded with a carbon-based cladding over at least a portion thereof; and
 - a plurality of external electrical components coupled to said plurality of conductive interconnects of said PCB to form an electrical circuit.

REMARKS

In the Restriction Requirement mailed on October 15, 2001, the Examiner requires restriction to one of four alleged inventions, identified as inventions I, II, III, and IV. This restriction requirement is respectfully traversed.

The Examiner takes the position that alleged inventions I and III are related as subcombinations disclosed as usable together in a single combination. It is submitted that alleged inventions I and III are not related as subcombinations but, instead, are related as combination and subcombination. To more clearly express this relationship, claim 19 has been amended to replace the term "interconnect" with the term "signal line having an elongated conductive member." In Section 806.05(c) of the M.P.E.P. it states, "In order to establish that combination and subcombination inventions are distinct, two-way distinctness must be demonstrated. . . . To support a requirement for restriction, both two-way distinctness and reasons for insisting on restriction are necessary, i.e., separate classification, status, or field of search." The Examiner has not demonstrated two-way distinctness between alleged invention I and alleged invention III.

The Examiner takes the position that alleged invention III has separate utility over alleged invention I, such as in a subsystem not requiring the specific signal line of alleged invention I. As described above, Claim 19 has been amended to recite a signal line such as the one of alleged invention I. In addition, as shown above, two-way distinctness must be demonstrated to support restriction between a combination and a subcombination, not separate utility.

For at least the foregoing reasons, it is submitted that the requirement of restriction between alleged inventions I and III should be withdrawn.

The Applicants provisionally elect the claims identified by the Examiner as alleged invention I (claims 1-14).

The Examiner is invited to contact Applicant's Representative John Scott at 480/596-3830 or the below signed attorney if there are any questions regarding this Response or if prosecution of this application may be assisted thereby.

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Respectfully submitted,

TERRENCE DISHONGH ET AL.

By their Representatives,

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Date Nov. 15, 2001 By Ann M. McCrackin

Ann M. McCrackin

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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: Commissioner of Patents, Washington, D.C. 20231, on this 15 day of November, 2001.

Jane E. Brockschink

Name

Jane Brockschink

Signature



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Docket No. 0884.357US1

Client Ref. No. P10041

Clean Version of Pending Claims

**APPARATUS FOR SHIELDING TRANSMISSION LINE EFFECTS ON A PRINTED
CIRCUIT BOARD**

Applicant: Terrance J. Dishongh et al.

Serial No.: 09/732,115

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1. A printed circuit board (PCB) comprising:
a dielectric board member; and
a first signal line supported on said dielectric board member, said first signal line including an elongated conductive member that is enshrouded with a carbon-based cladding over at least a portion of its length.
2. The PCB of claim 1, comprising:
a second signal line supported on said dielectric board member, said second signal line including a second elongated conductive member that is enshrouded with a carbon-based cladding over at least a portion of its length, said second signal line being adjacent to said first signal line.
3. The PCB of claim 2, wherein:
said carbon-based cladding of said second signal line is continuous with said carbon-based cladding of said first signal line.
4. The PCB of claim 2, wherein:
said carbon-based cladding of said second signal line is discontinuous with said carbon-based cladding of said first signal line.
5. The PCB of claim 1, comprising:
a second dielectric board member disposed above said first dielectric board member and said first signal line.

6. The PCB of claim 1, wherein:
said elongated conductive member is fully covered over top, bottom and side portions thereof with said carbon-based cladding for said at least a portion of its length.
7. The PCB of claim 1, wherein:
said elongated conductive member is covered with said carbon-based cladding over greater than 90% of an outer surface thereof.
8. The PCB of claim 1, wherein:
said carbon based cladding has a dielectric constant that is greater than a dielectric constant associated with said dielectric board member.
9. A printed circuit board (PCB) comprising:
a first metallic member that is covered over at least a portion thereof with a carbon-based cladding, said first metallic member to form a first node within an electrical circuit; and
a second metallic member proximate to said first metallic member, said second metallic member to form a second node within the electrical circuit;
wherein a portion of said carbon-based cladding provides a finite electrical resistance between said first metallic member and said second metallic member, said finite electrical resistance to allow an electrical current to flow between said first and second nodes of the electrical circuit during circuit operation.
10. The PCB of claim 9 wherein:
said second metallic member physically contacts said carbon-based cladding of said first metallic member.

11. The PCB of claim 9 wherein:

said second metallic member is also covered over at least a portion thereof with a carbon-based cladding, wherein said carbon-based cladding of said second metallic member physically contacts said carbon-based cladding of said first metallic member.

12. The PCB of claim 9 wherein:

said first metallic member includes an elongated signal line conductor.

13. The PCB of claim 9 wherein:

said first metallic member includes metallic plating within a plated through-hole.

14. The PCB of claim 9 wherein:

said first and second metallic members each include an elongated signal line conductor.

15. A multi-layer printed circuit board (PCB) comprising:

a first dielectric board member having a signal line supported thereon;

a second dielectric board member having a conductive terminal member supported thereon; and

a plated through-hole extending through said first and second dielectric board members, said plated through-hole including a metallic plating covering a carbon-based cladding adhered to an inner surface of said through-hole;

wherein said signal line is conductively coupled to said metallic plating of said plated through-hole through a portion of said carbon-based cladding, said portion of said carbon-based cladding to provide a finite electrical resistance between said signal line and said conductive terminal member within an electrical circuit to be formed using said multi-layer PCB.

16. The multi-layer PCB claimed in claim 15, wherein:
said signal line includes an elongated conductive member that is enshrouded with a carbon-based cladding over at least a portion of its length.
17. The multi-layer PCB claimed in claim 15, wherein:
said conductive terminal member forms a ground terminal on said second dielectric board member, said finite electrical resistance to act as a pull-down resistance within said electrical circuit.
18. The multi-layer PCB claimed in claim 15, wherein:
said conductive terminal member forms a supply terminal on said second dielectric board member, said finite electrical resistance to act as a pull-up resistance within said electrical circuit.
19. (Once Amended) An electrical subsystem comprising:
a printed circuit board (PCB) including at least one dielectric board member having a plurality of conductive interconnects for providing circuit interconnections within said electrical subsystem, said plurality of conductive interconnects including at least one signal line having an elongated conductive member that is enshrouded with a carbon-based cladding over at least a portion thereof; and
a plurality of external electrical components coupled to said plurality of conductive interconnects of said PCB to form an electrical circuit.
20. The electrical subsystem of claim 19, wherein:
said electrical subsystem is a computer processor board and said plurality of electrical components includes at least one digital processing device.

21. The electrical subsystem of claim 19, wherein:
said at least one interconnect is adjacent to another interconnect on said at least one dielectric board member, said carbon-based cladding to reduce noise coupling between said at least one interconnect and said another interconnect.
22. The electrical subsystem of claim 19, wherein:
said at least one interconnect is covered with said carbon-based cladding over top, bottom, and side portions thereof.
23. The electrical subsystem of claim 19, wherein:
a portion of said carbon-based cladding provides a finite electrical resistance between two conductive interconnects of said PCB, said finite electrical resistance to be used as a circuit element within said electrical circuit.
24. A method for manufacturing a printed circuit board (PCB) comprising:
providing a dielectric board member;
depositing a carbon-based cladding on an upper surface of said dielectric board member;
adding a metallic layer to an upper surface of said carbon-based cladding;
processing said metallic layer to produce a predetermined metallization pattern on said carbon-based cladding; and
depositing additional carbon-based cladding over at least a portion of said predetermined metallization pattern.
25. The method claimed in claim 24, comprising:
removing carbon-based cladding from a region between two signal lines of said predetermined metallization pattern to expose a portion of said upper surface of said dielectric board member.



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We are transmitting herewith the following attached items (as indicated with an "X"):

- ☒ A return postcard.
- ☒ Response to Restriction Requirement (3 Pages).
- ☒ Clean Version of Pending Claims (6 pgs.).

Please consider this a **PETITION FOR EXTENSION OF TIME** for sufficient number of months to enter these papers and please charge any additional required fees or credit overpayment to Deposit Account No. 19-0743.

SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A.
P.O. Box 2938, Minneapolis, MN 55402 (612-373-6900)

By: Ann M. McCrackin
Atty: Ann M. McCrackin
Reg. No. 42,858

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Jane E. Brockschink
Name

Jane E. Brockschink
Signature

Customer Number 21186

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